ON ONE SYSTEMIC DEVELOPMENT OF THE PROBLEM OF ALLOCATION

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Problem of discretic programming in conditions of manycriterial is considered. Set of work, being subject to fulfilment, is available. Are certain also: set of the executors; set, machines; set of resources (materials, semifinished items and etc.) and other set. As a functional complex name set, which will be formed, when on one representative of each of the specified sets is nominated to one working place. The allowable decision of a examined problem represents set of not crossed complexes provided that, for each working place one functional complex is certain in the accuracy.

The elementary case of a formulated above problem is known under the name " a problem about purposes " [1], when the complex is defined as a pair " an executor - working place ". In case of three-element complexes we come to a problem about three-combinations. In a general case the complex consists from m of elements and the problem of formation of m-element complexes is formulated on the m-colour column.

For the mathematical formulation of examined problems used the following designations: G= (V, E) - n-toped of the columns, in which to each edge å $\in$ Å are attributed of weight $w_\nu(e) \geq 0$, $\nu=1,2,..., N$; V_k - a subset of tops $v \in V$, painted in colour k, k= $\overline{1,m}$. In a general case the allowable decision of a problem is such subcolumn õ$\in$(V, E_x), $E_x \in E$, in which each component of conectingis a complete t- toped subcolumn , the tops of which are painted in various colours and thus for given whole τ condition $2 \leq t \leq \tau$ is carried out; X=X (G) = {x} - set of all allowable decisions (SAD) on given to column G. In a case τ=2 we receive a problem about pair-combinations on m- the colour column; in a case t= τ =3 we receive a problem about three-combinations on the m-colour column. On SAD Õ vector-objective function (VOF) is certain

$$F(x) = (F_1(x), F_2(x),..., F_N(x)) \quad (1)$$

$$F(x) = \sum_{e \in E_x} w(x) \rightarrow \min, \ \nu=1,2,..., N_1, \ N_1 \leq N, \quad (2)$$

$$F(x) = \max_{e \in E} w(x) \rightarrow \min, \ \nu=N_1 + 1, N_1 + 2,..., N. \quad (3)$$

VOF (1) with criteria of a kind MINSUM (2) and MINMAX (3) at $N \geq 2$ determines paret set $\tilde{X} \subseteq Õ$ [1]. "The best" decision gets out of complete set of alternatives (CSA) $Õ^0$. CSA such subset $X^0 \subseteq \tilde{X}$ Refers to as which has the minimum capacity $|Õ_0|$ at fulfilment of a condition $F(X^0) = F(\tilde{X})$ [1].

It is accepted to speak, that the examined problem has properties of completeness (cvazycompleteness), if for any column G= (V, E) will be such meanings of weights $w_\nu(e)$, $\nu=1,2,\ldots, m$, $e \in E$, at which equality $Õ^0 = \tilde{X} = Õ$ are carried out (parities $Õ^0 = \tilde{X} = Õ$ are carried out). In [1] is shown, that the problem about pair-combinations on one-colour (i.e. ordinary) column is complete, if in (2) meaning $N_1 \geq 2$. We shall formulate the following integration of this result

The theorem 1. At any $m \geq 1$ and $N_1 \geq 2$ problems about 2- and 3-combinations are complete.

The theorem 2. If $N_1 \leq 1$, at any $m \geq 1$ and any even $n \geq 8$ two-criteria the problem about pair-combinations on m-colour n-toped to the column is cvazycompleteness.

The theorem 3. If $N_1 \leq 1$, at any $m \geq 2$ and any $n \geq 9$, divisible 3, the problem about three-combinations on m-colour n-toped to the column is cvazycompleteness.

Through $\mu_2(n, m)$, $\mu_3(n, m)$ we shall designate the maximum capacity SAD according to problems about 2- and 3-combinations on m-colour n-toped column. From the theorem 3 follows, that in case of fulfilment of property of completeness as the bottom estimation of computing complexity of a finding CSA for a examined problem it is possible to accept meaning of the maximum capacity (q (n, m), $q = \overline{2,3}$. In this connection we result the exact formulas of calculation $\mu_q(n, m)$.

The theorem 4. For problems about combinations the exact formulas are correct:

$$\mu_2(n, 3) = \left[\binom{n/3}{n/6}\left(\frac{n}{6}\right)!\right]^3, \qquad \text{at n, divisible two;}$$

$$\mu_3(n, 3) = (l!)^2,\ l = n/3, \qquad \text{n is divisible 3;}$$

$$\mu_3(n, 4) = \left[\binom{n/4}{n/12}\binom{n/6}{n/12}^4\left(\frac{n}{12}\right)!\right]^8, \text{ n is divisible 12.}$$

THE LITERATURE

1. Emelichev V.À., Perepeliza V.À. Complexity discretic many-criterials of problems //Discretic mathematics.-1994.- V.6.